

Notice of Allowability

Application No.

10/823,191

Examiner

Kianni C. Kaveh

Applicant(s)

TRUTNA ET AL.

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/14/06 & 11/21/06.
2. ☒ The allowed claim(s) is/are 1-20 and 24-26.
3. ☒ The drawings filed on 13 April 2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>10</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

Applicant's canceling of claims 21-23 in the amendment/response submitted on 6/13/06 is acknowledged.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Garcia on 11/21/06 in order to overcome the teachings of the prior art of the record and thus to allow the case.

Please amend claim 1 as follows:

Claim 1 (currently amended): A wavelength tunable light source, comprising:

a resonant light path supporting oscillation of light in at least one longitudinal mode; an optical gain medium disposed in the resonant light path;

an optical reflection grating have a reflective grating surface arranged to receive incident light along the light path at an incidence angle relative to the grating surface and to diffract light from the reflective grating surface along the light path at a diffraction angle relative to the grating surface different from the incidence angle;

a first acousto-optic deflector arranged to intercept light along the light path, and operable to deflect the intercepted light and to induce a first Doppler shift of longitudinal mode frequencies; and

a second acousto-optic deflector arranged to intercept light along the light path, and operable to deflect the intercepted light and to induce a second Doppler shift of longitudinal mode frequencies, wherein the first and second Doppler shifts are in opposite directions.

Please amend claim 25 as follows:

Claim 25 (new): [[The wavelength tunable light source of claim 1, further comprising: wherein]]

A wavelength tunable light source, comprising:

a resonant light path supporting oscillation of light in at least one longitudinal mode;

an optical gain medium disposed in the resonant light path;

an optical grating have a grating surface arranged to receive incident light along the light path at an incidence angle relative to the grating surface and to diffract light along the light path at a diffraction angle relative to the grating surface different from the incidence angle;

a first acousto-optic deflector arranged to intercept light along the light path, and operable to deflect the intercepted light and to induce a first Doppler shift of longitudinal mode frequencies;

a second acousto-optic deflector arranged to intercept light along the light path, and operable to deflect the intercepted light and to induce a second Doppler shift of longitudinal operations comprising:

driving the first acousto-optic device with a first signal having a first time-varying frequency profile; and
driving the second acousto-optic device with a second signal having a second time-varying frequency profile, wherein the second time-varying frequency profile differs from the first time-varying frequency profile by an amount substantially proportional to a time rate of change of the output wavelength profile;
wherein the output light beam is tunable over the specified frequency range without observable hopping between longitudinal modes, and
the first and second time-varying frequency profiles (f_1 and f_2) are give by:

$$f_2 = A + B\lambda + \alpha/4 \, d\lambda/dt$$

and

$$f_1 = A + B\lambda + \alpha/4 \, d\lambda/dt$$

wherein A, B, and α are constants and $d\lambda/dt$ is the time range of change of the output wavelength profile λ .

Reason for Allowance

Claims 1-20 and 24-26 are allowed for the following reasons:

The instant application is deemed to be directed to a nonobvious improvement over the invention patented in Pat. No. Thomson et al. (Thomson) (US 6031852).

Claim 1 is allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious an optical reflection grating have a reflective grating surface arranged to receive incident light along the light path at an incidence angle relative to the grating surface and to diffract light from the reflective grating surface along the light path at a diffraction angle relative to the grating surface

different from the incidence angle in combination with the rest of the limitations of the base claim. Claims 2-20, 24 and 26 are allowed by virtue of dependency."

Claim 25 is allowed because the prior art of record, taken alone or in combination, fails to disclose or render obvious the first and second time-varying frequency profiles (f_1 and f_2) are give by:

$$f_2 = A + B\lambda + \alpha/4 \, d\lambda/dt$$

and

$$f_1 = A + B\lambda + \alpha/4 \, d\lambda/dt$$

wherein A, B, and a are constants and $d\lambda/dt$ is the time range of change of the output wavelength profile λ in combination with the rest of the limitations of the base claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kianni C. Kaveh whose telephone number is 571-272-2417. The examiner can normally be reached on 9:30-19:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2883

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Cyrus Kianni
Primary Patent Examiner
Group Art Unit 2883

A handwritten signature in black ink, appearing to read 'K. Kianni', with a long horizontal flourish extending to the right.

**KAVEH KIANNI
PRIMARY EXAMINER**

November 22, 2006